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LIII.—*A new Cestode and other Parasitic Worms from Spitsbergen, with a Note on Two Leeches. Results of the Oxford University Expedition to Spitsbergen.—No. 6.*
By H. A. BAYLIS, M.A., D.Sc.

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THE parasitic worms collected by members of the Oxford University Expedition to Spitsbergen include a new and interesting Cestode from a seal, two species of Acanthocephala, and one of Nematoda. The writer is indebted to Mr. C. S. Elton for kindly handing this material to him for determination.

The following are the species contained in the collection:—

CESTODA.

CYCLOPHYLLIDEA.

Fam. Tetrabothriidæ.

Anophryocephalus anophrys, gen. et sp. n.

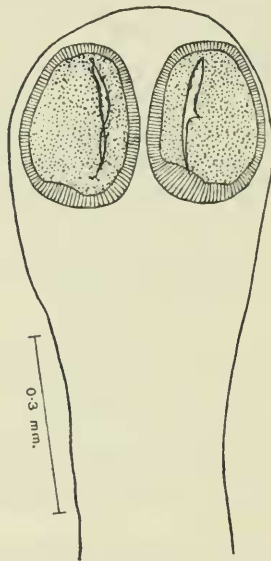
Host: a young female seal (*Phoca hispida*?). Locality: Klaas Billen Bay.

This interesting form agrees closely with typical species of the genus *Tetrabothrius* in its general anatomy, but differs strikingly from that genus in the structure of its scolex. In *Tetrabothrius* the scolex is always provided with "auricular appendages," more or less highly-developed, but in the present species such structures are entirely absent, the scolex having the general appearance of that of the Anoplocephalidæ or of certain unarmed genera of other families.

The material consists largely of fragments, but the length of a complete specimen appears to be about 65 mm. The maximum width of the strobila is about 0.85 mm. The dorso-ventral thickness is relatively great, so that some specimens are almost cylindrical in shape. The scolex (fig. 1) is somewhat compressed dorso-ventrally, and has a

transverse diameter of 0.46–0.55 mm. Two of the suckers are situated on the dorsal and two on the ventral surface. They are of an oval shape, having a diameter of about 0.3 mm. antero-posteriorly and of 0.2 mm. transversely. The apertures of the suckers are in the form of longitudinal slits. The scolex is followed by a narrower unsegmented "neck," which may attain a length of 6 or 7 mm. There may or may not be a constriction immediately behind the scolex. In a complete strobila some 490 segments can be counted. All the segments are broader than long. The

Fig. 1.



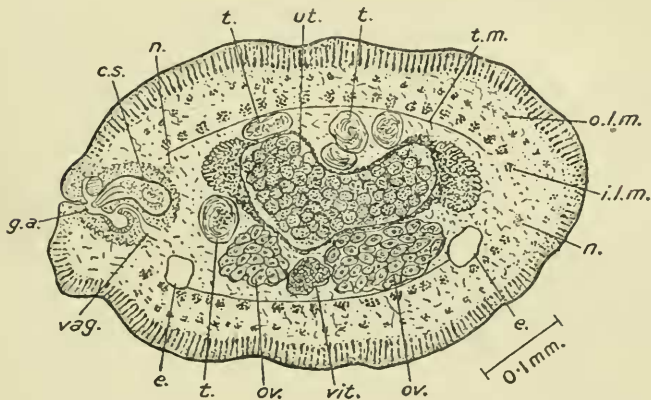
Anophryocephalus anophrys. The scolex
(from a stained specimen in balsam).

genital organs appear early, and the number of sexually mature segments is relatively large. The uterus does not become a conspicuous organ until about the 350th segment is reached. The disappearance of the male and female glands, after the appearance of the uterus, is very gradual, and some traces of them remain even in the oldest gravid segments observed.

The subcuticular layer of the body-wall contains large numbers of elongated gland-cells, staining deeply with hæmatoxylin. The cortical parenchyme is thick, measuring

in depth nearly a quarter of the total dorso-ventral diameter of the worm. The longitudinal musculature is well-developed, consisting of an inner layer (fig. 2, *i.l.m.*) of larger, and an outer layer (fig. 2, *o.l.m.*) of smaller, bundles of fibres. Of the former there are about twenty bundles dorsally and a similar number ventrally. They lie immediately outside the very scanty layer of transverse fibres (fig. 2, *t.m.*), which forms the boundary between the cortical and medullary parenchyme. At the level of this transverse layer, on the ventral side, lie the two large ventral longitudinal excretory canals (figs. 2, 3, *e.*). Dorsal

Fig. 2.



Anophryocephalus anophrys. Transverse section through a mature segment.

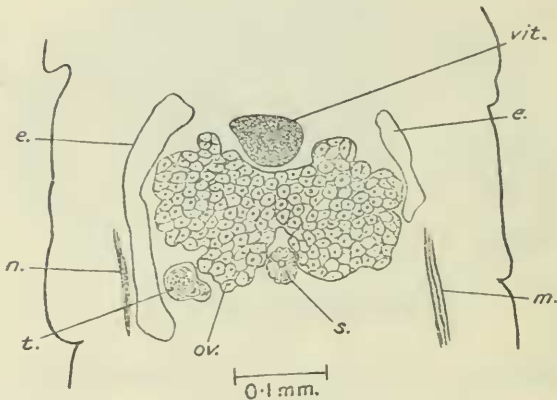
c.s., cirrus-sac; *e.*, *e.*, excretory vessels; *g.a.*, genital atrium; *i.l.m.*, inner layer of longitudinal muscles; *n.*, *n.*, longitudinal nerves; *o.l.m.*, outer layer of longitudinal muscles; *ov.*, ovary; *t.*, *t.*, testes; *t.m.*, transverse muscles; *ut.*, uterus; *vag.*, vagina; *vit.*, yolk-gland.

longitudinal canals and transverse connecting vessels between the ventral canals appear to be entirely absent.

The genital pores are all on the right side. The genital ducts pass dorsally to the excretory canal and ventrally to the longitudinal nerve of that side. The external pore leads by a narrow canal into a rather small genital atrium (fig. 2, *g.a.*), corresponding to that of *Tetrabothrius*, into which the cirrus-sac and vagina open separately, the latter ventrally to the former. Immediately below the opening of the vagina the wall of the atrium forms a small, rounded,

muscular chamber. The cirrus-sac (fig. 2, *c.s.*) is more elongate than in *Tetrabothrius*, and measures about 0.125 mm. in length and 0.05 mm. in thickness. There is a much-coiled vas deferens. The vagina, near its opening into the genital atrium, is very narrow, but after a short distance widens suddenly into a large thin-walled tube. This runs towards the middle line of the segment, and then curves dorsally, narrowing again here and becoming invested with a conspicuous outer coat of glandular cells. The large testes (figs. 2, 3, *t.*) are about thirty in number, and are mostly situated on the dorsal side of the segment. Some, however, lie at the level of the uterus, especially

Fig. 3.



Anophrycephalus anophrys. Horizontal section through a mature segment, towards the ventral side.

e., *e.*, excretory vessels; *m.*, one of the longitudinal muscle-bundles; *n.*, nerve; *ov.*, ovary; *s.*, shell-gland; *t.*, testis; *vit.*, yolk-gland.

anteriorly and posteriorly to it, and a few are even found still more ventrally. The ovary (figs. 2, 3, *ov.*) is a large bilobed organ, occupying the whole width of the medullary parenchyme when fully-developed. It has a narrow "waist" in the middle region, and two large, backwardly-directed, lateral lobes. In the space between these lobes is situated the shell-gland (fig. 3, *s.*). In front of the middle portion of the ovary is the compact yolk-gland (figs. 2, 3, *vit.*), its duct passing ventrally to the "waist" of the ovary straight back towards the shell-gland. The uterus (fig. 2, *ut.*) appears as a crescentic transverse tube, as in

Tetrabothrius, lying dorsally to the ovary and with the horns of the crescent directed posteriorly. Its wall is composed of cells which stain very deeply with hæmatoxylin. It gradually expands in the older segments, but never entirely loses its original crescentic shape.

Onchospheres have not been observed. It may be that the gravid segments are lost before the full development of the ova in the uterus has taken place.

In view of the arrangement of the genital organs, it seems necessary to regard this form as very closely related to *Tetrabothrius*. In addition to the difference in the structure of the scolex, the condition of the excretory system (absence of dorsal vessels and transverse ventral vessels) and the shape of the cirrus-sac (as distinct from the squat, spherical or triangular shape usual in *Tetrabothrius*) are possibly characters of generic importance.

The family Tetrabothriidæ is at present usually restricted to the genus *Tetrabothrius*. (The form described by the writer (1914) under the name of *Octopetalum* probably does not belong to this family.) The presence of auricular appendages, therefore, has hitherto been regarded as a family character, and the inclusion of *Anophryocephalus* in the family necessitates alteration of the family diagnosis in this particular. The family diagnosis given by Lühe (1910) also includes the condition of the excretory canals usual in *Tetrabothrius*, but this is omitted by other authors (Fuhrmann (1908), Ransom (1909)).

It is interesting to observe that some species attributed to *Tetrabothrius* are recorded in Cetacea, although the majority of the species are found in birds. In seals, up to the present, all the cestodes recorded appear to belong to the Pseudophyllidea (genera *Diphyllobothrium*, *Pyramicocephalus*, *Diplogonoporus*, &c.).

NEMATODA.

Fam. Ascaridæ.

Contracæcum osculatum (Rud., 1802).

A small immature individual, probably belonging to this species, was taken from the stomach of the same seal.

ACANTHOCEPHALA.

Corynosoma strumosum (Rud., 1802).

Several specimens were found attached to the wall of the large intestine of the seal already mentioned.

Echinorhynchus longicollis, Villot, 1875.

The body of a turnstone (*Arenaria interpres*), preserved in spirit, was submitted to the writer to be examined for internal parasites. In the upper part of the intestine there were a number of cestodes of one or two species, too poorly preserved to be identified. In the lower portion, for some three inches above the origin of the caeca, were found several specimens of the above-mentioned *Echinorhynchus*. At the point of attachment of each worm there was a conspicuous nodular swelling on the external surface of the wall of the intestine. Two of the worms were attached at the same level, so that the two nodules, viewed from the exterior, at first looked like a paired structure proper to the bird's intestine. Each nodule was filled with dense material, in which the proboscis of the worm was firmly embedded.

Echinorhynchus longicollis does not seem to have been fully described, and its proper systematic position remains uncertain. Lühe (1911) suggests that it perhaps belongs to the genus *Arhythmorhynchus* or to some closely-related genus. In *Arhythmorhynchus* the proboscis is highly characteristic, having a swelling in the middle of its length and remarkable local variations in the form and size of the hooks. There is also a characteristic swelling of the anterior portion of the body. These peculiarities are absent in the present material. The proboscis appears to be nearly cylindrical and the hooks of almost uniform size, so that it appears impossible to assign the species to *Arhythmorhynchus*. The condition of the material, however, scarcely warrants an attempt to give a new description.

HIRUDINEA.

Two leeches were obtained by dredging in Klaas Billen Bay, and these appear to belong to the following species:— (1) *Abranchus scorpii* (Malm), taken at about 15 fathoms; (2) probably *Pontobdella muricata* (L.). The latter is a very small individual, and does not show the characteristic warty papillæ of the skin. These, however, are not always visible in *P. muricata**. The specimen had stained the spirit in which it was received a bright green, and the presence of a green pigment soluble in alcohol is highly suggestive of *P. muricata*.

* See Harding, 'Parasitology,' iii. (1910), p. 144.

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LIV.—*New Ants from Australia.*

By W. C. CRAWLEY, B.A., F.E.S., F.R.M.S.

THIS paper deals, with one or two exceptions, with ants collected by Mr. J. Clark in Western Australia, principally in the Perth district. In addition to new species, races, and varieties, we have been able, thanks to Mr. Clark's very thorough collecting, to add descriptions of many males and females of species the workers of which were hitherto only known.

Opportunity has been taken to re-describe some of F. Smith's much discussed types, as a good deal of misapprehension has existed among foreign myrmecologists who have been unable to see the types themselves.

I am indebted to my friend, Professor Carlo Emery, for his unfailing kindness in giving me the benefit of his knowledge in doubtful cases.

List of Species.

Subfam. Ponerinæ.

Myrmecia vindex, Sm.—— *LUTEA*, sp. n.—— *harderi*, For., race *SWALEI*, st. n.—— *nigriscapa*, Roger.—— *chasei*, For., var. *LUDLOWI*, nov.—— *CLARKI*, sp. n.—— (*Pristomyrmecia*) *mandibularis*, Sm.—— (——) *michaelseni*, For., var. *PERTHENSIS*, nov.*Amblyopone michaelseni*, For.—— *australe*, Erichs.*Phyracaces* *CLARKI*, sp. n.*Rhytidoponera punctata*, Sm.—— *convexa*, Mayr, race *violacea*, For., var. *SUBUMBRATA*, nov.—— (*Chaleoponera*) *metallica*, Sm.—— (——) ——, var. *INORNATA*, nov.—— (——) ——, var. *VARIANS*, nov.—— (——) *aspera*, Roger. ♂ ♀ hitherto undescribed.